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International Application No.	
International Filing Date 14.10.2003	
PCT INTERNATIONAL APPLICATION ΔΙΕΘΝΗΣ ΑΙΤΗΣΗ	
Name of receiving Office and "PCT International Application"	
Applicant's or agent's file reference (if desired) (12 characters maximum)	

<b>Box No. I TITLE OF INVENTION</b>	
Preparation method for meat based products, with direct incorporation of olive oil and addition of feta type cheese	
<b>Box No. II APPLICANT</b> <input type="checkbox"/> This person is also inventor	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
"CRETA FARM ANONIMOS VIOMICHANIKI & EMPORIKI ETAIREIA" Prinos (Latzimas Locality), Municipality of Arkadi 741.00 Rethymnon Greece	
State (that is, country) of nationality: GR	Telephone No. +30 2831 058 026
	Facsimile No. +30 2831 058 036
	Teleprinter No.
	Applicant's registration No. with the Office
State (that is, country) of residence: GR	
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input checked="" type="checkbox"/> all designated States except the United States of America <input type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<b>Box No. III FURTHER APPLICANT(S) AND/OR (FURTHER) INVENTOR(S)</b>	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country. The country of the address indicated in this Box is the applicant's State (that is, country) of residence if no State of residence is indicated below.)	
Domazakis Emmanouil 5, Moatsou Str. 741.00 Rethymnon Greece	
State (that is, country) of nationality: GR	This person is: <input type="checkbox"/> applicant only <input checked="" type="checkbox"/> applicant and inventor <input type="checkbox"/> inventor only (If this check-box is marked, do not fill in below.)
State (that is, country) of residence: GR	Applicant's registration No. with the Office
This person is applicant for the purposes of: <input type="checkbox"/> all designated States <input type="checkbox"/> all designated States except the United States of America <input checked="" type="checkbox"/> the United States of America only <input type="checkbox"/> the States indicated in the Supplemental Box	
<input type="checkbox"/> Further applicants and/or (further) inventors are indicated on a continuation sheet.	
<b>Box No. IV AGENT OR COMMON REPRESENTATIVE; OR ADDRESS FOR CORRESPONDENCE</b>	
The person identified below is hereby/has been appointed to act on behalf of the applicant(s) before the competent International Authorities as: <input checked="" type="checkbox"/> agent <input type="checkbox"/> common representative	
Name and address: (Family name followed by given name; for a legal entity, full official designation. The address must include postal code and name of country.)	
Tsirimonakis Matthew Attorney at law 53, Stournari Str. 104.32 Athens Greece	
Telephone No. +30 210 522 64 13	Facsimile No. +30 210 524 32 77
Teleprinter No.	Agent's registration No. with the Office
<input type="checkbox"/> Address for correspondence: Mark this check-box where no agent or common representative is/has been appointed and the space above is used instead to indicate a special address to which correspondence should be sent.	

## Box No. V DESIGNATION STATES

Mark the applicable check-boxes below. At least one must be marked.

The following designations are hereby made under Rule 4.9(a):

## Regional Patent

- ☐ **AP ARIPO Patent:** GH Ghana, GM Gambia, KE Kenya, LS Lesotho, MW Malawi, MZ Mozambique, SD Sudan, SL Sierra Leone, SZ Swaziland, TZ United Republic of Tanzania, UG Uganda, ZM Zambia, ZW Zimbabwe, and any other State which is a Contracting State of the Harare Protocol and of the PCT (if other kind of protection or treatment desired, specify on dotted line) .....
- ☒ **EA Eurasian Patent:** AM Armenia, AZ Azerbaijan, BY Belarus, KG Kyrgyzstan, KZ Kazakhstan, MD Republic of Moldova, RU Russian Federation, TJ Tajikistan, TM Turkmenistan, and any other State which is a Contracting State of the Eurasian Patent Convention and of the PCT
- ☒ **EP European Patent:** AT Austria, BE Belgium, BG Bulgaria, CH & LI Switzerland and Liechtenstein, CY Cyprus, CZ Czech Republic, DE Germany, DK Denmark, EE Estonia, ES Spain, FI Finland, FR France, GB United Kingdom, GR Greece, HU Hungary, IE Ireland, IT Italy, LU Luxembourg, MC Monaco, NL Netherlands, PT Portugal, RO Romania, SE Sweden, SI Slovenia, SK Slovakia, TR Turkey, and any other State which is a Contracting State of the European Patent Convention and of the PCT
- ☐ **OA OAPI Patent:** BF Burkina Faso, BJ Benin, CF Central African Republic, CG Congo, CI Côte d'Ivoire, CM Cameroon, GA Gabon, GN Guinea, GQ Equatorial Guinea, GW Guinea-Bissau, ML Mali, MR Mauritania, NE Niger, SN Senegal, TD Chad, TG Togo, and any other State which is a member State of OAPI and a Contracting State of the PCT (if other kind of protection or treatment desired, specify on dotted line) .....

## National Patent (if other kind of protection or treatment desired, specify on dotted line):

- |   |  |   |
|---|--|---|
| <input checked="" type="checkbox"/> AE United Arab Emirates               | <input checked="" type="checkbox"/> HR Croatia                                   | <input checked="" type="checkbox"/> OM Oman                     |
| <input type="checkbox"/> AG Antigua and Barbuda                           | <input checked="" type="checkbox"/> HU Hungary                                   | <input type="checkbox"/> PG Papua New Guinea                    |
| <input checked="" type="checkbox"/> AL Albania                            | <input checked="" type="checkbox"/> ID Indonesia                                 | <input type="checkbox"/> PH Philippines                         |
| <input checked="" type="checkbox"/> AM Armenia                            | <input checked="" type="checkbox"/> IL Israel                                    | <input checked="" type="checkbox"/> PL Poland                   |
| <input checked="" type="checkbox"/> AT Austria                            | <input type="checkbox"/> IN India  | <input checked="" type="checkbox"/> PT Portugal                 |
| <input checked="" type="checkbox"/> AU Australia                          | <input checked="" type="checkbox"/> IS Iceland                                   | <input checked="" type="checkbox"/> RO Romania                  |
| <input checked="" type="checkbox"/> AZ Azerbaijan                         | <input checked="" type="checkbox"/> JP Japan                                     | <input checked="" type="checkbox"/> RU Russian Federation       |
| <input checked="" type="checkbox"/> BA Bosnia and Herzegovina             | <input type="checkbox"/> KE Kenya  | <input type="checkbox"/> SC Seychelles                          |
| <input type="checkbox"/> BB Barbados                                      | <input checked="" type="checkbox"/> KG Kyrgyzstan                                | <input type="checkbox"/> SD Sudan                               |
| <input checked="" type="checkbox"/> BG Bulgaria                           | <input type="checkbox"/> KP Democratic People's Republic of Korea                | <input checked="" type="checkbox"/> SE Sweden                   |
| <input type="checkbox"/> BR Brazil  | <input type="checkbox"/> KR Republic of Korea                                    | <input checked="" type="checkbox"/> SG Singapore                |
| <input checked="" type="checkbox"/> BY Belarus                            | <input checked="" type="checkbox"/> KZ Kazakhstan                                | <input checked="" type="checkbox"/> SK Slovakia                 |
| <input type="checkbox"/> BZ Belize  | <input type="checkbox"/> LC Saint Lucia  | <input type="checkbox"/> SL Sierra Leone                        |
| <input checked="" type="checkbox"/> CA Canada                             | <input type="checkbox"/> LK Sri Lanka  | <input type="checkbox"/> SY Syrian Arab Republic                |
| <input checked="" type="checkbox"/> CH & LI Switzerland and Liechtenstein | <input type="checkbox"/> LR Liberia  | <input checked="" type="checkbox"/> TJ Tajikistan               |
| <input checked="" type="checkbox"/> CN China                              | <input type="checkbox"/> LS Lesotho  | <input checked="" type="checkbox"/> TM Turkmenistan             |
| <input type="checkbox"/> CO Colombia                                      | <input checked="" type="checkbox"/> LT Lithuania                                 | <input type="checkbox"/> TN Tunisia                             |
| <input type="checkbox"/> CR Costa Rica                                    | <input checked="" type="checkbox"/> LU Luxembourg                                | <input checked="" type="checkbox"/> TR Turkey                   |
| <input type="checkbox"/> CU Cuba  | <input checked="" type="checkbox"/> LV Latvia                                    | <input type="checkbox"/> TT Trinidad and Tobago                 |
| <input checked="" type="checkbox"/> CZ Czech Republic                     | <input type="checkbox"/> MA Morocco  | <input type="checkbox"/> TZ United Republic of Tanzania         |
| <input checked="" type="checkbox"/> DE Germany                            | <input checked="" type="checkbox"/> MD Republic of Moldova                       | <input checked="" type="checkbox"/> UA Ukraine                  |
| <input type="checkbox"/> DK Denmark                                       | <input type="checkbox"/> MG Madagascar   | <input checked="" type="checkbox"/> UG Uganda                   |
| <input type="checkbox"/> DM Dominica                                      | <input checked="" type="checkbox"/> MK The former Yugoslav Republic of Macedonia | <input checked="" type="checkbox"/> US United States of America |
| <input type="checkbox"/> DZ Algeria                                       | <input type="checkbox"/> MN Mongolia   | <input checked="" type="checkbox"/> UZ Uzbekistan               |
| <input type="checkbox"/> EC Ecuador                                       | <input type="checkbox"/> MW Malawi   | <input type="checkbox"/> VC Saint Vincent and the Grenadines    |
| <input checked="" type="checkbox"/> EE Estonia                            | <input type="checkbox"/> MX Mexico   | <input type="checkbox"/> VN Viet Nam                            |
| <input checked="" type="checkbox"/> ES Spain                              | <input type="checkbox"/> MZ Mozambique   | <input checked="" type="checkbox"/> YU Serbia and Montenegro    |
| <input checked="" type="checkbox"/> FI Finland                            | <input type="checkbox"/> NI Nicaragua  | <input type="checkbox"/> ZA South Africa                        |
| <input checked="" type="checkbox"/> GB United Kingdom                     | <input checked="" type="checkbox"/> NO Norway                                    | <input type="checkbox"/> ZM Zambia                              |
| <input type="checkbox"/> GD Grenada                                       | <input checked="" type="checkbox"/> NZ New Zealand                               | <input type="checkbox"/> ZW Zimbabwe                            |
| <input checked="" type="checkbox"/> GE Georgia                            |  |   |
| <input type="checkbox"/> GH Ghana   |  |   |
| <input type="checkbox"/> GM Gambia  |  |   |

Check-boxes below reserved for designating States which have become party to the PCT after issuance of this sheet:

☐☐☐

**Precautionary Designation Statement:** In addition to the designations made above, the applicant also makes under Rule 4.9(b) all other designations which would be permitted under the PCT except any designation(s) indicated in the Supplemental Box as being excluded from the scope of this statement. The applicant declares that those additional designations are subject to confirmation and that any designation which is not confirmed before the expiration of 15 months from the priority date is to be regarded as withdrawn by the applicant at the expiration of that time limit. (Confirmation (including fees) must reach the receiving Office within the 15-month time limit.)

**Box No. VI PRIORITY CLAIM**

The priority of the following earlier application(s) is hereby claimed:

Filing date of earlier application (day/month/year)	Number of earlier application	Where earlier application is:		
		national application: country or Member of WTO	regional application: regional Office	international application: receiving Office
item (1) 17 March 2003 (17.03.03)	20030100131	GR		
item (2)				
item (3)				
item (4)				
item (5)				

☐ Further priority claims are indicated in the Supplemental Box.

The receiving Office is requested to prepare and transmit to the International Bureau a certified copy of the earlier application(s) (only if the earlier application was filed with the Office which for the purposes of this international application is the receiving Office) identified above as:

☐ all items   
 ☒ item (1)   
 ☐ item (2)   
 ☐ item (3)   
 ☐ item (4)   
 ☐ item (5)   
 ☐ other, see Supplemental Box

\* Where the earlier application is an ARIPO application, indicate at least one country party to the Paris Convention for the Protection of Industrial Property or one Member of the World Trade Organization for which that earlier application was filed (Rule 4.10(b)(ii)): ....

**Box No. VII INTERNATIONAL SEARCHING AUTHORITY**

Choice of International Searching Authority (ISA) (if two or more International Searching Authorities are competent to carry out the international search, indicate the Authority chosen; the two-letter code may be used):

ISA / EP.....

Request to use results of earlier search; reference to that search (if an earlier search has been carried out by or requested from the International Searching Authority):

Date (day/month/year)

Number

Country (or regional Office)

**Box No. VIII DECLARATIONS**

The following declarations are contained in Boxes Nos. VIII (i) to (v) (mark the applicable check-boxes below and indicate in the right column the number of each type of declaration):

Number of declarations

- |   |  |   |
|---|--|---|
| <input type="checkbox"/> Box No. VIII (i)             | Declaration as to the identity of the inventor   | : |
| <input type="checkbox"/> Box No. VIII (ii)            | Declaration as to the applicant's entitlement, as at the international filing date, to apply for and be granted a patent             | : |
| <input type="checkbox"/> Box No. VIII (iii)           | Declaration as to the applicant's entitlement, as at the international filing date, to claim the priority of the earlier application | : |
| <input checked="" type="checkbox"/> Box No. VIII (iv) | Declaration of inventorship (only for the purposes of the designation of the United States of America)                               | : |
| <input type="checkbox"/> Box No. VIII (v)             | Declaration as to non-prejudicial disclosures or exceptions to lack of novelty   | : |

1

**Box No. VIII (iv) DECLARATION: INVENTORSHIP** (only for the purposes of designation of the United States of America)  
*The declaration must conform to the following standardized wording provided for in Section 214; see Notes to Boxes Nos. VIII, VIII (i) to (v) (in general) and the specific Notes to Box No. VIII (iv). If this Box is not used, this sheet should not be included in the request.*

**Declaration of inventorship (Rules 4.17(iv) and 51bis.1(a)(iv))  
 for the purposes of the designation of the United States of America:**

I hereby declare that I believe I am the original, first and sole (if only one inventor is listed below) or joint (if more than one inventor is listed below) inventor of the subject matter which is claimed and for which a patent is sought.

This declaration is directed to the international application of which it forms a part (if filing declaration with application).

This declaration is directed to international application No. PCT/..... (if furnishing declaration pursuant to Rule 26ter).

I hereby declare that my residence, mailing address, and citizenship are as stated next to my name.

I hereby state that I have reviewed and understand the contents of the above-identified international application, including the claims of said application. I have identified in the request of said application, in compliance with PCT Rule 4.10, any claim to foreign priority, and I have identified below, under the heading "Prior Applications," by application number, country or Member of the World Trade Organization, day, month and year of filing, any application for a patent or inventor's certificate filed in a country other than the United States of America, including any PCT international application designating at least one country other than the United States of America, having a filing date before that of the application on which foreign priority is claimed.

Prior Applications: GR.20030100131, 17th March 2003 .....

I hereby acknowledge the duty to disclose information that is known by me to be material to patentability as defined by 37 C.F.R. § 1.56, including for continuation-in-part applications, material information which became available between the filing date of the prior application and the PCT international filing date of the continuation-in-part application.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name: Domazakis Emmanouil .....

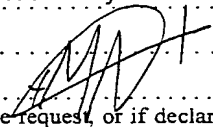
Residence: Rethymnon - Greece .....

(city and either US state, if applicable, or country)

Mailing Address: 5, Moatsou Str. ....

741.00 Rethymnon - Greece .....

Citizenship: Greek .....

Inventor's Signature:  .....

(if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date: October 10, 2003 .....

(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

Name: .....

Residence: .....

(city and either US state, if applicable, or country)

Mailing Address: .....

Citizenship: .....

Inventor's Signature: .....

(if not contained in the request, or if declaration is corrected or added under Rule 26ter after the filing of the international application. The signature must be that of the inventor, not that of the agent)

Date: .....

(of signature which is not contained in the request, or of the declaration that is corrected or added under Rule 26ter after the filing of the international application)

☐ This declaration is continued on the following sheet, "Continuation of Box No. VIII (iv)".

## Box No. IX CHECK LIST; LANGUAGE OF FILING

This international application contains:

(a) in paper form, the following number of sheets:

request (including declaration sheets) : 5  
 description (excluding sequence listings and/or tables related thereto) : 6  
 claims : 1  
 abstract : 1  
 drawings : 1

Sub-total number of sheets : 13

sequence listings : 1

tables related thereto : 1

(for both, actual number of sheets if filed in paper form, whether or not also filed in computer readable form; see (c) below)

Total number of sheets : 13

(b) ☐ only in computer readable form (Section 801(a)(i))(i) ☐ sequence listings(ii) ☐ tables related thereto(c) ☐ also in computer readable form (Section 801(a)(ii))(i) ☐ sequence listings(ii) ☐ tables related thereto

Type and number of carriers (diskette, CD-ROM, CD-R or other) on which are contained the

☐ sequence listings: .....☐ tables related thereto: .....

(additional copies to be indicated under items 9(ii) and/or 10(ii), in right column)

This international application is accompanied by the following item(s) (mark the applicable check-boxes below and indicate in right column the number of each item):

1. ☐ fee calculation sheet :  
 2. ☐ original separate power of attorney :  
 3. ☒ original general power of attorney : 1  
 4. ☐ copy of general power of attorney; reference number, if any: ..... :  
 5. ☐ statement explaining lack of signature :  
 6. ☒ priority document(s) identified in Box No. VI as item(s): ..... : 1  
 7. ☐ translation of international application into (language): ..... :  
 8. ☐ separate indications concerning deposited microorganism or other biological material :  
 9. ☐ sequence listings in computer readable form (indicate type and number of carriers)  
 (i) ☐ copy submitted for the purposes of international search under Rule 13ter only (and not as part of the international application) :  
 (ii) ☐ (only where check-box (b)(i) or (c)(i) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Rule 13ter :  
 (iii) ☐ together with relevant statement as to the identity of the copy or copies with the sequence listings mentioned in left column :  
 10. ☐ tables in computer readable form related to sequence listings (indicate type and number of carriers)  
 (i) ☐ copy submitted for the purposes of international search under Section 802(b-quater) only (and not as part of the international application) :  
 (ii) ☐ (only where check-box (b)(ii) or (c)(ii) is marked in left column) additional copies including, where applicable, the copy for the purposes of international search under Section 802(b-quater) :  
 (iii) ☐ together with relevant statement as to the identity of the copy or copies with the tables mentioned in left column :  
 11. ☐ other (specify): ..... :

Number of items

Figure of the drawings which should accompany the abstract:

Language of filing of the international application:

English

## Box No. X SIGNATURE OF APPLICANT, AGENT OR COMMON REPRESENTATIVE

Next to each signature, indicate the name of the person signing and the capacity in which the person signs (if such capacity is not obvious from reading the request).

  
 Tsirimonakis Matthew - Agent

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1. Date of actual receipt of the purported international application:

14 October 2003 (14.10.2003)

3. Corrected date of actual receipt due to later but timely received papers or drawings completing the purported international application:

4. Date of timely receipt of the required corrections under PCT Article 11(2):

5. International Searching Authority (if two or more are competent):

ISA / E.P.O

6. ☐ Transmittal of search copy delayed until search fee is paid

2. Drawings:

☐ received:☒ not received:

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Date of receipt of the record copy by the International Bureau:

10/506411

DT05 Rec'd PCT/PTO 01 SEP 2004

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## DESCRIPTION

**Preparation method for meat based products,  
with direct incorporation of olive oil  
and addition of feta type cheese**

This invention concerns the preparation of meat-based products with the following main characteristics:

- 5 1. The use or otherwise of olive oil, instead of the ordinary practice of adding animal fat (fat tissue)
2. The use of fat-free, skeletal muscle (meat)
3. The addition of special ancillary substances
4. The addition of a 'feta' type cheese
- 10 5. The application of appropriate technological procedures and mechanisms developed with a view to:
  - Preparing a solid emulsion - meat pulp with a solid structure, capable of undergoing appropriate heat treatment, with the aim of incorporating and retaining the solid composition of olive oil and feta, after protein
  - 15 coagulation, in the emulsion's basic system which consists of muscle proteins, water and olive oil.
  - Achieving the maximum possible conservation of the organoleptic, physical-chemical and nutritional characteristics of the differentiating factor, olive oil
  - 20 • Achieving the maximum possible conservation of the physical-chemical organoleptic and nutritional characteristics of feta.

25 The name "feta" is registered as a protected designation of origin (PDO) to indicate the salted white cheese traditionally produced in Greece and in particular made with milk originating exclusively from the regions of Macedonia, Thrace, Sterea Ellada (Central Greece), the Peloponnese and the prefecture of Lesbos. The milk used for the production of feta should be sheep's milk or a mixture of sheep's milk and goats' milk. The milk's origin constitute a basic characteristic of the cheese produced, as it

30 provides it with its organoleptic features - its flavour, aroma, colour and even structure and texture.

As far as their structure is concerned, cooked and smoked meat preparations constitute an "emulsion" with the following constituent components: milk proteins,

35 water (from the meat and milk added) and added fat (fat tissue).

The solidness of the "emulsion" depends basically, inter alia, on the capacity of the meat to retain the water and homogenise the added fat.

40 More particularly, the muscle proteins and especially the salt-soluble ones (actin, myosin and actomyosin), which represent the largest part (around 60%) of the myofibrils, contribute to the solidness of the "emulsion", as well as to its succulence. They also act as a protective envelop of the incorporated fat, which constitutes the discontinuous phase of the emulsion and the primary destabilisation factor.

- The solid incorporation of the fat (fat globules) and of the additional material (feta pieces) into the "emulsion" constitutes the technological aim of this invention, which is dealt with using well-known hyphenated techniques that favour the above and concern
- 5 the adjustment of parameters, such as the special selection and preparation of meat, the adjustment of the meat pulp pH, the amount of salt added, the use of ancillary substances, the addition of olive oil, the treatment-preparation conditions of the meat pulp, heat treatment, and refrigeration of the finished product etc.
- 10 Many products on the international market, which have been accepted by the large majority of consumers, are based on the addition of milk products to meat-based products. Hard cheese (with a short or long maturity time) is primarily used for such products.
- 15 According to studies, it has been found that the fatty acid content differs in each kind of cheese and depends on the initial quality of the milk added, on the kind of milk (sheep's milk, cow's milk, goat's milk etc or the percentage of each kind that is added to the milk mixture), the maturation time and the preparation method. Moreover, it
- 20 also depends on the geographical origin of the milk since local changes in the feedstuffs and in the type of animal diet followed affects the fatty acid content of the milk added to produce the cheese.
- The flavour and the aroma, which characterise a certain kind of cheese, results from its maturity, that is the primary decomposition of lactose, fat and protein of the cheese
- 25 and the secondary conversion of its products, through various fermentation procedures which they undergo during the maturation process of the cheese.
- The distinctive flavour and the aroma of each kind of cheese does not result from a specific substance, but from a large number of substances, each one having different taste, but all together and relatively proportionately giving flavour to the cheese and in
- 30 fact the final flavour which determines which kind of cheese it is. Moreover, from the fatty acids, it is acetic acid which gives an acidic flavour; and rancid butter and caproic, caprylic and capric acids which give a peppery flavour.
- Feta is a semi-salted cheese with high acidity. Among the fatty acids contained in the
- 35 product, acetic acid prevails, but when preparations made from the stomach of a sheep and a goat are included in the volatile enzymes used to coagulate the milk, then, fatty acids C6 - C10 strongly contribute to the cheese's flavour, by adding a peppery flavour. Typical feta made with sheep's milk has high ethanol, propanol and butanol content.
- 40 The structure of the cheese is a dense mesh of protein fibres differently cross-linked. The fat globules and whey are included in that mesh, that is the humidity and the water-soluble components of the cheese. Over the course of time, during the maturation process of the cheese, many protein fibre links break, releasing calcium and
- 45 forming soft monocalcium paracaseinate and paracaseinate. The cheese undergoes an internal conversion and obtains its final structure and texture that can be characterised as soft, friable, granular etc.
- Every kind of cheese is characterised by the proportion of amino acids, sulphide

compounds, acid esters and fatty acids, which result from the proteolysis of the protein mesh.

5 The uniqueness of feta type cheese products, which have been protected by the Council of the European Union, and which as a cheese has been accepted by a large majority of consumers as a tasty product rich in nutrients, was the reason why we conducted this study.

10 Nevertheless, the incorporation of oil, compared to the ordinary addition of pork fat, if attempted using classic techniques, gives rises to stability difficulties or the development of destabilizing tensions affecting not only the meat pulp emulsion, but also the final product, which displays the phenomenon of oil exudation.

15 There are also some established techniques of direct incorporation of vegetable fat, which include the procedure of preliminary heat treatment of oil at 100° C two consecutive times.

Moreover, olive oil is a more particular case, as its role in human nutrition is discernible among seed oils and other vegetable oils and as it is also internationally acknowledged for the beneficial characteristics of its natural components (see Omega  
20 fatty acids and their protective role, low cholesterol levels, polyphenols and their role).

It is thus considered appropriate that:

25 On one hand, olive oil, as an ingredient replacing the animal fat, should be added to cooked/smoked meat preparations, under particularly protective conditions, in order to ensure the maximum possible transfer of its properties to the product.

30 On the other hand, through the incorporation procedure of the olive oil and the addition of feta, the traditional technical production of cooked and smoked meats should be ensured, by regularly considering scientific data based on the properties of the proteins, fats, oil and feta and on the properties of the link between them.

It should also be borne in mind that the solidness of "meat emulsions" is strongly affected by:

- 35
- The origin and composition of the fat to be incorporated
  - The physical – chemicals such as
    - Profile of fatty acids (kind and degree of saturation)
    - SFI (solid fat index)
    - The relation between PUFA (polyunsaturated fatty acids), MUFA
- 40 (monounsaturated fatty acids) / SUFA (saturated fatty acids) to the applicable temperatures at the various production stages.

It is obvious that technologically the differences between pork fat and olive oil should be considered seriously in the production of a solid emulsion.

45 Moreover, the following points should also be considered:

- The particularity of feta, in order to conserve its initial structure, flavour, aroma and composition (humidity and salt content), when added to the meat pulp, during heat treatment, so as to conserve its nutritional components, its



structure and its organoleptic characteristics.

- The microbial growth of feta which is different from that of meat, in order to avoid possible development of pathogenic micro-organisms and the increase of the total mesophilic flora in the meat to non-acceptable levels, where the heat treatment is not effective enough to ensure a safe product.

At critical production temperatures (0-4 °C and up to 71 °C), blast freezing temperatures (after heat treatment) and the temperatures at which it is then stored (0-4°C), its SFI plays an important role.

In the case of olive oil, its characteristics presuppose its incorporation under certain conditions, as follows:

- The creation of the maximum possible incorporation of the oil through mechanical processes (mixing, homogenisation of the participating components)
- The calculation of the ideal quantitative relationship between these components, in order to ensure the maximum possible absorption and conservation of the oil into the emulsion, as well as the maximum possible absorbance of additional water (relationship between fat and proteins, protein and water)
- The creation of a solid, impermeable protein mesh around the fat globules, without applying high temperatures to denature the proteins, through mechanical processes and under selected conditions of vacuum application and temperature, during the mixing and homogenisation – with the maximum possible dispersion and the maximum size of fat globules.

In the case of feta, its characteristics presuppose its addition under certain conditions, as follows:

- The calculation of the ideal quantitative relationship between meat, water, olive oil and feta, in order firstly to ensure its acceptance by consumers and secondly to create a solid protein mesh between the meat pulp and the feta pieces, capable of preventing feta seeping out after heat treatment, refrigeration and the cutting of the product into slices. According to the study conducted, the incorporation of olive oil can vary between 5% and 15% and the addition of feta between 5% and 20 % of the final product.
- The creation of appropriate physical – chemical conditions (pH, water activity, salt content etc) applied to the product, in combination with the application of appropriate temperatures, during the stages of production, heat treatment, refrigeration (after heat treatment) and preservation, in order to prevent the development of undesired micro-organisms (due to different microbial flora of the two products, meat and feta).

- 5        - The creation of a solid protein mesh of meat and feta, capable, after the heat treatment and the application of mechanical processes – under selected conditions of vacuum application and temperature, during mixing, homogenisation, heat treatment and refrigeration, of maintaining the initial structure and texture of feta to the maximum degree, which is due to it being composed of dicalcium paracaseinate, monocalcium paracaseinate and paracaseinate, as well as its flavour resulting mainly from its fatty acid content.

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This invention aims at the production of meat-based products:

- By incorporating olive oil or otherwise, directly and at low temperature and by replacing the maximum possible quantity of animal fat
- 15        ▪ By adding pieces of feta type cheese
- By adding combined ancillary substances, and
- By applying special technological processes

20        This has been achieved by mixing fat-free meat at low temperature with olive oil, in combination with the use of emulsifying additives, water, olive oil and the addition of feta covered with an appropriate protein mesh.

Moreover, the solidness of the feta added to the aforementioned products is achieved by the combined use of heat treatment (time, temperature) and the size of the product.

25        The heat transfer rate, during the heat treatment to pasteurise the product, should be such that it will preserve the space lattice of the feta added.

Thus, this invention concerns cooked/smoked meat preparations with olive oil and feta and one production method, the mixing of olive oil, fat-free meat, water and feta at

30        low temperature.

Finely chopped, fat-free meat at a temperature of 0°C is mixed with water at 2°C in a mixing machine, while at the same time, salt is added. Then, preservatives, auxiliary salts (i.e. salt, nitrates, citrate salt), sugars, water and seasonings (i.e. oregano, pepper, paprika, tomato, mint) are added. When the temperature of the mixture rises up to 2°C, olive oil is added. Mixing continues with the simultaneous vacuum application of 960 mBAR for 3 min, which firstly aims at freeing the oxygen captured in the mixture, in order to prevent oxidation and secondly at achieving the solidness of the emulsion (olive, water, meat), until the temperature of the mixture rises up to 4°C. Then follows

35        the addition of feta cut into cubes of 1 x 1 cm. Vacuum mixing continues until the feta is totally dispersed throughout the meat pulp. The total mixing time is 15 min and the absorbed power 26KW. The mixture is conveyed to the filling machine, where it is stored, with simultaneous vacuum application of 1000 mBAR and absorbed power 7 KW. Then, it is pasteurised at 71°C. The total heat treatment time and the heat transfer rate vary between 1 and 3 hours, so as not to affect the structure of the feta. After

40        pasteurisation, the product is deep-frozen in a blast refrigeration unit at a temperature varying between -2°C and 2°C, in order to successfully achieve the thermal shock required for product safety.

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The aforementioned production method can be applied even without the addition of olive oil, but retaining the other parameters and producing meat-based products with feta.

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Smoked/cooked meat preparations with feta and olive oil produced based on this invention have an exceptional solidness (cohesion) as far as their structure is concerned, due to the use of fat-free meat, the application of low temperatures and its vacuum preparation. The physical-chemical characteristics of the olive oil and feta

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contained in the products remain unaltered, due to the low temperatures applied during the production procedure.

**CLAIMS**

**Preparation method for meat based products,  
with direct incorporation of olive oil  
and addition of feta type cheese**

1. Preparation method for meat-based products, which is characterised by the incorporation of olive oil, instead of animal fat and the addition of feta type cheese.  
5 This method includes the following stages:
  - (a) Mixing of the fat-free meat at a temperature of 0°C with H<sub>2</sub>O at a temperature of 2°C, salt, preservatives and auxiliary salts.
  - 10 (b) Addition of olive oil
  - (c) Mixing then continues, with simultaneous vacuum application for 3 min until the product temperature rises up to 4°C.
  - (d) Addition of feta. Vacuum mixing continues until the feta is totally dispersed throughout the meat pulp
  - 15 (e) The mixture is conveyed to the filling machine, where it is stored, with simultaneous vacuum application 1000 mbar and then it is pasteurised at 71°C. Total heat treatment time during pasteurisation depends on the diameter of the final product and varies between 1 and 3 hours.
  - 20 (f) After pasteurisation, the product is conveyed to a freezer unit at a maximum temperature of 2°C
2. A preparation method in line with claim (1), where the quantity of olive oil added to the product varies between 2 and 20% of the final product.
3. A preparation method in line with claim (1), where the quantity of feta added to the product varies between 2 and 25%.
- 25 4. Meat-based products with olive oil and feta which are prepared using the method described in claim (1).
5. Preparation method for meat-based products characterised by the addition of the feta type cheese, in line with claim (1), without the incorporation of olive oil.
- 30 6. Meat-based products characterised by the addition of feta and prepared in line with the method described in claims (1) and (5).

## SUMMARY

### **Preparation method for meat based products, with direct incorporation of olive oil and addition of feta type cheese**

5 Preparation method for meat-based products with the direct incorporation of olive oil and the addition of the feta type cheese, which involves the following stages: (a) mixing of fat-free meat with water, salt, preservatives and auxiliary salts (b) addition of olive oil and mixing (c) addition of feta pieces and mixing (d) storage of the mixture with simultaneous vacuum application and pasteurisation (e) deep-freezing of the product.

10 The meat-based products with olive oil and feta prepared in line with the aforementioned method have exceptional solidness, as far as structure is concerned, and retain the physical-chemical characteristics of the olive oil and the organoleptic characteristics of the feta contained in the products.

15 Using the aforementioned method, preparation of such products can be assured even without the incorporation of olive oil, with the addition of feta type cheese only.